GRASS-FED DAIRY STEER ENTERPRISE ANALYSIS FOR ALEXANDRE FAMILY ECODAIRY FARMS

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By

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ABSTRACT

Alexandre Family EcoDairy Farms (AFEF) is a family dairy farm, producing organic milk in northern California. In the last decade, AFEF has been expanding in value added natural food enterprises, including pastured free-range eggs, pastured pork and grass-fed beef.

This study focuses on the analysis of an organic grass-fed ground beef from dairy-beef cross steers coming from AFEF. The grass fed beef enterprise was analyzed by adopting a UC Davis cost and returns study, modifying it to AFEF production limitations and conditions. Through partial budgeting analysis, opportunity costs were discovered leading to breakeven prices for the final grass fed ground beef product.

AFEF should begin the grass-fed beef enterprise as described in this analysis. Ground beef can safely be priced between the mean, $7.36, and one standard deviation above the mean, $8.55, given past experience by AFEF in value added health food enterprises. At these prices, the realized profit per steer is $1,094 and $1,616 respectively. When opportunity costs of raising less replacement heifers are analyzed, ($319/head), the income is $775 and $1,297 respectively. With this grass-fed beef enterprise, AFEF will be able to retain dairy bull calves and make a profit doing so.

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Chapter 1

INTRODUCTION

Through the last decade (2000-2010) consumers have been changing to new food consumption trends. Though initially small, these trends are gaining speed. Alternative agriculture production practices are appealing to a larger group of consumers than ever before. Words like "organic," "natural," "local," and "grass-fed" are becoming more common on the shelves of retail stores, many restaurants, natural food stores, and farmers' markets (Dimitri and Oberholtzer 2012; Johnson, Marti, and Gwin 2012; Thilmany-McFadden, Umberger, and Wilson 2009; Weber, Heinze, and DeSoucey 2008; Ziehl, Thilmany, and Umberger 2005).

The grass-fed[1] beef movement made up only 0.02 percent of the beef market in 2006 (Weber, Heinze, and DeSoucey 2008) and approximately 3 percent in 2010 (Brickley 2010), while commanding higher prices from willing consumers (Gwin, *et al.*, 2012). Some producers have expanded on these niche markets by providing "premium priced" or "value-added" products.

Alexandre Family EcoDairy Farms (AFEF) – Crescent City, Del Norte County, is a family organic dairy business in Northern California that produces milk for the national cooperative Organic Valley, La Farge, WI. AFEF is the largest producer of organic milk in northern California. In addition to organic milk production, AFEF has been in the business of value added products for the last decade; selling grass-fed pork to natural and health food

[1] Grass-fed as defined by the Agricultural Marketing Service (AMS) of the United States Department of Agriculture (USDA) (2007): Grass and/or forage shall be the feed source consumed for the lifetime of the ruminant animal, with the exception of milk consumed prior to weaning. The diet shall be derived solely from forage and animals cannot be fed grain or grain by-products and must have continuous access to pasture during the growing season.

retailers in Humboldt County and organic eggs. The high demand for some of these products has led AFEF to spin off their pastured egg business, creating Alexandre Kids, LLC (Figure 1). With this prior experience in value added natural food enterprises, a grass-fed beef project appears a

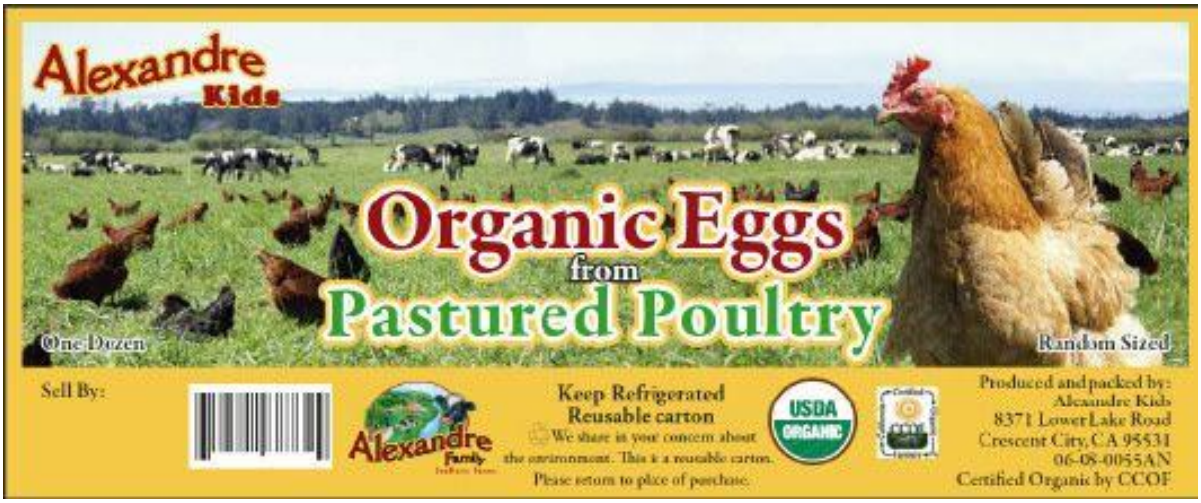

Figure 1. Alexandre Kids Eggs, LLC One Doz. Carton Label.

I am a partner in an organic pastures egg business, Alexandre Kids Eggs, LLC, selling eggs to 26 Whole Foods Markets in Central California. We have adopted a price leadership mentality keeping our egg prices approximately 1.1 standard deviations above the mean. (Appendix 1)

likely area for enterprise expansion.

Within all dairies, the need to maintain dairy cattle on a breeding cycle to ensure herd heifer replacements results in the production of many bull calves, not useful in a dairy's operations. Generally, these bull calves are sold at ages of less than a week old. AFEF sells bull calves to Redwood Meat Co., Eureka, 100 miles south of AFEF's main dairy. AFEF is fortunate to be located on lands that are abundant with high quality pastureland almost year round, due to many environmental factors. Do to these unique conditions and the dairy's ability to provide pasture year around, AFEF is currently considering the sale of organic grass-fed beef from

surplus bull calves as steers. AFEF has experience raising dairy steers for limited beef production, but has not taken full advantage of retaining available bull drop-calves.

AFEF is considering a two season beef enterprise to be implemented in the first few years in order to simplify management and only use a few months of dairy bull drop-calves to keep total numbers around 300 head. Spring season and fall season sales of 150 head each will be assessed.

Problem Statement

Can AFEF efficiently retain and add value to dairy bull calves through an organic grass-fed steer enterprise?

Hypothesis

Raising organic grass-fed dairy steers from weaned bull calves will enhance net returns and be resource effective. The revenue objective is subject to AFEF principle constraints of retaining organic certification as non-organic methods are not an option.

Objectives

1. To identify prices consumers have paid for organic grass-fed ground beef in California.
2. To estimate the variable and fixed costs of raising a grass-fed steer from weaned calf to mature harvest weight.
3. To assess the effect of price ($/lb.) changes in the final product on the feasibility of raising grass-fed steers.

Justification

Dimitri and Oberholtzer (2012) found the total sale of organic foods had risen from $3.6 billion in 1997 to $21.1 billion by 2008, which is an increase of almost 600 percent over eleven years. With a growing organic industry, this study will help current and future organic dairy farmers retain the organic and grass-fed value of their bull calves. This research will have a direct impact on the management of AFEF. This could become a new product that would utilize a certified organic beef label under AFEF to be sold at local Humboldt and Del Norte County retail stores. In the consumer perception of the organic market, this product will capture a potential niche that has not been seized by any operations in Del Norte County.

AFEF employs approximately: 40 employees on two organic dairies in Crescent City, Del Norte, 12 employees on an organic dairy in Ferndale, 3 employees on an organic grass-fed dairy in Eureka, Humboldt, 10 employees on two hay ranches in Cedarville, Modoc County. AFEF manages approximately 60 percent and 10 percent of the total dairy cows in Del Norte and Humboldt Counties respectively. AFEF has the ability to provide over 800 weaned three-month-old dairy steers per year for this ground beef product. Acreage available to raise these steers is either leased or owned in Del Norte, Humboldt, and Modoc Counties.

Table 1. Agricultural Land Use in Del Norte County.

Crop	2009 Acres	Percent of Total
Pasture Forage Misc.	17,500	70.4%
Pasture Irrigated	4,500	18.1%
Hay Other Unspecified	2,530	10.2%
Nursery	318	1.3%
Total	24,848 Acres	100.0%

Source: Del Norte County Economic and Demographic Profile. 2012.

High quality forages for beginning and finishing steers and a lesser quality forage is available between starting and finishing to fully utilize grazing resources. Table 1 shows the distribution of harvested acres in Del Norte County in 2009 showing that most of the land in the county is in permanent pasture including all of AFEF's managed land in the county.

Chapter 2

REVIEW OF THE LITERATURE

Growing Trends

Many consumers want to know where their food is coming from. They want to know how animals are raised, fed, treated, and harvested; so it makes sense that products labeled as "local" are on the rise. Johnson, Marti, and Gwin (2012) report the U.S. Congress adopted definition of locally produced products are those marketed within 400 miles from its origin, or in-state. Local is easy to understand, and provides a connection from producer to consumer. Direct-to-consumer marketing in the U.S. has increased from just over half a billion dollars in 1997 to $1.2 billion in 2007, an increase of 118 percent in ten years. This marketing is coming in the form of local food markets like farmers' markets (Johnson, Marti, and Gwin 2012). No longer are local and organic foods sold only in natural food stores or at farmers' markets. By 2008 almost half of all organic foods were purchased by consumers in conventional supermarkets, club stores, and big-box stores (Dimitri and Oberholtzer 2012).

Although they do not make up a large percentage of the U.S. beef market, the use of alternative production systems, like natural, certified organic, and grass-fed, have grown at a rate of approximately 20 percent per year for several years (Brickley 2010). Lozier, Rayburn, and Shaw (2004) stated that from the viewpoints of production and marketing, one area that has grown is an interest in pasture-based beef systems.

Niche Market

Grass-fed products were sold at a discount only 15 years ago because there was no foreseen benefit to them. They now sell at premiums and have commanded their own market niche, as a recognized and distinctive area of production, exchange, and consumption. This is a result of a grassroots movement motivated by rural community development, health awareness, and desire for sustainable agriculture. The grass-fed movement, along with similar alternative production movements, has risen in opposition to the large industrial agricultural system that has become dominant since World War II (Weber, Heinze, and DeSoucey 2008).

Bringing the grass-fed movement into the public eye started in the 1990s with promotion of nutritional benefits, such as fatty acids that came from grass-fed verses corn-fed beef. Weber, Heinze, and DeSoucey (2008) found through studying the grass-fed movement that when widespread social codes in society, or even in small groups of potential producers and consumers, new markets were created. Through the use of services tailored to these social codes a market movement can be sustained. Social movements were found to fuel solutions in entrepreneurial production, the creation of collective producer identities, and the establishment of regular exchange between producers and consumers.

The prime factor that Dimitri and Oberholtzer (2012) found influenced consumers buying organic products was education. Education, more than age, race, ethnic group, or income influenced consumers to buy alternatively produced products. Thilmany, Umberger, and Ziehl (2006) found greater potential strength in marketing product quality differences tied to production methods, as differentiated products.

The consumer of a grass-fed product buys with certain feelings in mind. Gwin, *et al.*, (2012) used the results of a consumer taste test in Portland, Oregon to examine consumer attitudes comparing grass-fed and conventional grain-fed beef. In the study, choice-based analysis looked at taste preferences, willingness-to-pay, and willingness-to-buy frozen packaged meat in bulk. They found that the baseline uninformed consumer will pay $0.90-$0.94/lb. more for grass-fed beef, and that knowledge about production and nutritional factors increases this premium by an additional $0.55/lb. Thilmany-McFadden, Umberger, and Wilson (2009) found consumer attitudes and concerns in relation to production practices like the treatment of animals and environmental impacts distinguished their willingness-to-pay premiums above conventional products. Williams (2006) claimed consumers would pay 30 percent more for meats labeled natural and a staggering 15-200 percent more for those certified as organic.

In order to maintain a niche market, the operation must be able to consistently produce a high quality product. Failure to do so can result in dissatisfied customers and lower future meat sales (Forero, *et al.*, 2012).

Dairy vs. Beef Breeds

Carcass characteristics have a big impact on quality and grading in meat production. One of the biggest factors influencing carcass traits is breed (Clarke, *et al.*, 2009). This Irish study used 151 bulls and steers of multiple beef and dairy breeds raised and harvested to compare live animal measurements, carcass traits, and carcass value. The cattle were split into four groups where dairy and beef breeds were harvested as bulls at 14-16 months or as steers at approximately 24 months of age. Data was then assembled by quality scoring different meat cuts.

Beef breeds scored higher in many of the most relevant meat measures over dairy breeds in carcass gain and meat produced of 24 to 33 percent (Clarke, *et al.*, 2009).

Dairy and beef breeds historically have been bred for two different functions in the U.S., milk or meat. Garrett (1971) assessed the differences in these two breed categories by looking at dairy Holsteins and beef Hereford cattle's gross and net efficiency of energy utilization for growth. He concluded Herefords were more efficient in converting feed energy consumed above maintenance to energy storage as fat and protein by 20 percent and 12 percent respectively. He further concluded that with the protein gain per unit of food almost being identical, the real difference lay in increased "grained fat" tissue or marbling of the Hereford breed.

Rust and Abney (2005) took Garrett's dairy versus beef breed analysis and summarized it, along with 12 other trials, totaling 1,559 head of steers between 1959 and 2004. The cost of gain averaged $0.53/lb. for beef steers, and varied for Holsteins from $0.54 to $0.65/lb. increasing as the starting weight increased. Genetically, the beef breeds gain more weight at a lower cost. Rust and Abney (2005) found carcass qualities and dressing percent were significantly less for Holstein steers compared to beef; however, Holsteins had a greater percentage of their carcasses graded as USDA prime at their desired carcass weights.

Grass-Fed Beef Enterprise

Grass-fed beef can be sold in many forms, - in the simplest form - a single animal to a neighbor - or with much more complexity - a group of producers raising animals under one local meat brand marketed year round to restaurants, retailers, and food services (Johnson, Marti, and Gwin 2012).

Time

The steps in raising a grass-fed steer from a weaned calf to a sellable finished product at a farmers' market are seen in Table 2. This is a typical schedule for a sessional California operation that would sell at a farmers' market.

Table 2. Operations Calendar for Grass-fed Beef.

Month	Operation
April 15 to October 15	Irrigated Pasture
April to October	Vaccination/Deworming
September	Reserve Harvest Date
October	Start Farmers Market Planning
October (varies according to ranch)	Harvest Animals and Process into Retail Cuts
November	Start Farmers Market Sales

*Calendar will vary according to ranch and farmers' market
Source: Forero, *et al.*, 2012.

Forero, *et al.*, (2012) designed a cost and returns study of a grass-fed beef enterprise. In this enterprise example, they set some basic parameters for a typical Central California operation including: the goal to get cattle to harvest weight and standards as quickly as possible, and the operation must have the ability to grow to meet market opportunities (demand). Daily gains in such an operation can vary from 1.00 – 2.75 pounds per day because of changing seasons and weather, and vary more based on health, body condition, mineral nutrition, and stock density.

Marketing

Larson, *et al.*, (2004) developed a flow diagram of marketing channels available to a grass-fed beef business (see Figure 2). These channels are more important to small beef businesses that often play a major role in every avenue of this flowchart to end consumers. In many cases, a few different marketing channels would have to be used in a beef business in order to be profitable. Some of the case scenarios highlighted in their study included: the sale of beef through internet sales, individual sales, and retail sales; all of which require the use of meat processing in a USDA inspected plant. A majority of customers would buy quantities greater than a ¼ beef if they knew a producer or a friend referred them (Gwin, *et al.*, 2012).

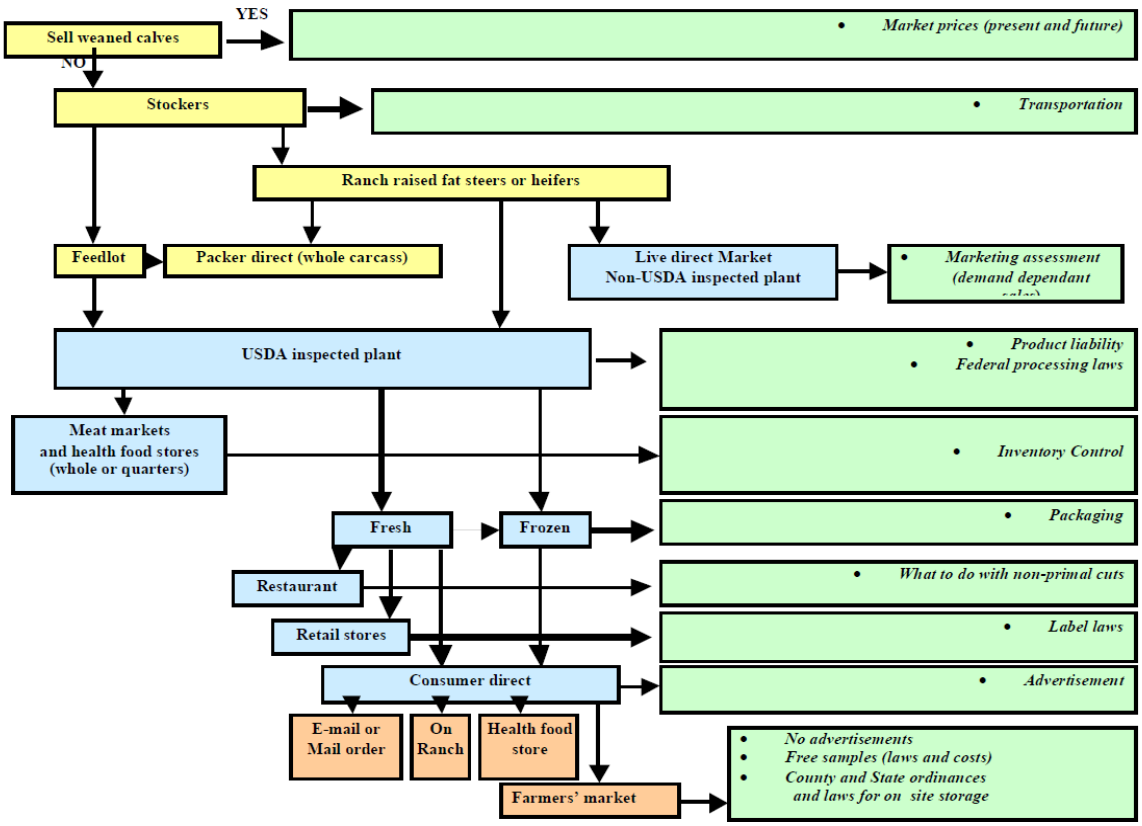

Figure 2. Grass-fed Beef Marketing Flowchart.

Source: Larson, *et al.*, 2004.

Delivery

Thiboumery and Lorentz (2009) suggested that small beef operations unable to compete on a volume basis in the conventional beef market can better sell their product by offering animals whole, half, or by the quarter, or selling direct to consumers through frozen cuts when fresh meat is not possible.

In a national survey of 149 respondents selling grass-finished[2] beef, Lozier, Rayburn, and Shaw (2004) stated that the marketing of the individuals did not follow the seasonality of the operation if they were a seasonal operation, because product was often frozen and then sold throughout the year (Table 3). They found that 95 percent of producers surveyed reported selling to local individuals and less than 7 percent reported selling to chain supermarkets or wholesalers.

Table 3. Survey Results of 149 Firms Marketing Grass-Finished Beef.

Table 24 Do you sell seasonally or year-round?		
	count	percent
seasonal	76	52
year-round	69	48
Totals	145	100

Table 25 Who do you sell to?		
	count	percent
local individuals	142	95
independent stores	42	28
chain supermarkets	8	5
restaurants	24	16
wholesalers	11	7
other	26	17

Source: Lozier, Rayburn, and Shaw 2004.

[2] Grass-finished according to the AMS of the USDA (2006) is not different than "grass (forage) fed" because the addition of a grass-finished category would only confuse consumers and lessen the meaning of a grass (forage) fed claim.

Price Determination

The grass-fed beef industry can be seen as a type of oligopoly. Tomek and Robinson (2003) point out that the features of an oligopolistic market are that there are relatively few firms and there is recognized interdependence among firms. When it comes to price determination, there are firms that are price leaders, followers, or both. Leaders set prices, with some knowledge of the current consumer market, knowing that doing so will influence other firms to follow. This is a form of price leadership.

Northern California Forages

George, *et al.*, (1992) completed a study on five northern California irrigated pastures compared to New Zealand's Northern Island of similar conditions, see Figure 3, measuring pasture growth rates. During winter months, growth/acres/day can average below 10 lbs. and in the height of summer, over 50 lbs.

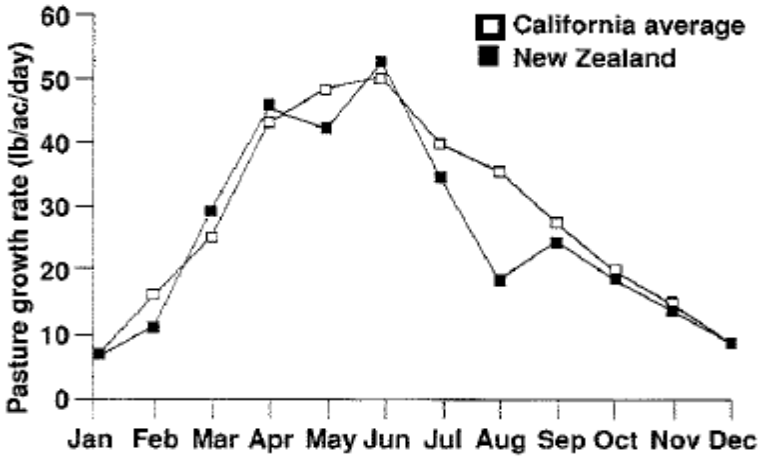

Figure 3. Mean Pasture Growth Rate (5 Northern California, 2 New Zealand Pastures). Source: George, *et al.*, 1992.

Chapter 3

METHODOLOGY

Procedures for Data Collection

Data collected consisted of consumer prices paid for organic grass-fed beef on May 12th 2013. Final product, grass-fed ground beef prices will be sought from producers online and in retail stores. Online producer databases included California State University-Chico (2013) and FarmPlate (2013), and a retail store Whole Foods Market, San Rafael, CA.

In order to estimate the cost of raising a grass-fed steer from a weaned calf to mature harvest weight, the historical records from AFEF were used as they have raised dairy steers in 2007 and 2010 and kept limited associated revenues and cost records. Also, information necessary to modify an example cost and returns budget will be gathered from the owner of AFEF, Blake Alexandre.

Lastly, price quotes for organic pastured eggs will be collected to assess current business strategies of price leadership by Alexandre Kids, LLC (Crescent City).

Procedures for Data Analysis

The U.C. Davis Cooperative Extension cost and returns study, "Sample Cost for Finishing Beef Cattle on Grass…," (Forero, *et al.*, 2012) was used as a platform to model the localized grass-fed beef enterprise in order to assess relevant incomes and cost. That budget, as seen in Appendix 2, was modified and adapted to fit AFEF's location, cost, inputs, number of steers, *etc*.

A partial budget analysis was used to analyze the organic grass-fed beef enterprise to view this enterprise's effects; that is, the increases and decreases in income and expenses of AFEF as a whole. Opportunity cost was estimated using the cost per head saved by raising replacement dairy heifers in-house instead of buying on the open organic market.

Grass-fed ground beef price quotes gathered were averaged across the various beef producers to define a current market price mean and standard deviation that the consumer is willing to pay for farmer direct or at retail prices.

The effects of changes in $/lb. of the finished ground beef product on the feasibility of raising grass-fed steers were assessed. By looking at this, one will be able to see the effects on profitability of price changes for grass-fed ground beef and determine the enterprise feasibility, a price sensibility assessment.

A meaningful price markup compared to the mean was found for an organic grass-fed ground beef product through the adaptation of pricing strategies already used by Alexandre Kids, LLC.

Assumptions

Many assumptions were made when there are so many variables in the dairy steer enterprise budget, which include operating, feed, and fixed costs and revenues. For the use in this grass-fed beef enterprise analysis, steers will be raised from weaned calves to 22-23 months of age at a weight of approximately 1,300 lbs. and processed largely into ground beef.

It is assumed that suitable values for variables were found without intentionally affecting the hypothesis. It is also assumed that the historical information on the revenues and expenses of grass-fed steers at AFEF were accurate and have not changed drastically over the years. Another

historical factor that will be assumed as constant was that weather would not play a significant role different in the life of the steers from one year to the next. It is also assumed that AFEF will continue to be successful, therefore using this study as a means to make decisions in the future. It is also assumed that Redwood Meat Co. will continue to be the primary destination for all cattle harvesting, the next closest USDA harvesting plant is much further away. AFEF has had experience in other value-added enterprises including pork, eggs, butter, and some dairy beef products that have led to some brand recognition that will carry over to beef products. Lastly, it's assumed that the people contacted for data in this study are knowledgeable and the information is true.

Limitations

As the purpose of this study is to advise AFEF in the use of their bull calves, the recommendations will not fit all dairies unless inputs, geographical regions, and markets are modified.

Chapter 4

DEVELOPMENT OF THE STUDY

In order to measure the feasibility of the grass-fed beef enterprise, a model budget will be formed, with variables and inputs discussed, and lastly, a probable price determined.

Case Study

The first task was to adapt the Forero, *et al.*, (2012) UC Davis case study (see Appendix 2) for the local conditions of AFEF's grass-fed beef enterprise. This began with reverse engineering the budget on Microsoft Excel and then changing variables and inputs in order to generate a budget that more accurately reflected AFEF's conditions.

The UC Davis case study contained budgets for 20 head of cattle sold as end products in two different forms; whole carcasses, and farmers' market 50 pound boxes. For AFEF, two seasonal groups of cattle would need to be adapted to their budget consisting of spring and fall start groups containing 150 head each. This means two tables were made with only slight variations due to differing start times.

Table 4 lists the changes made to this case study. For example, the number of head changed from 20 beef feeder heifers starting at 800lbs to two groups of weaned dairy-beef cross steers starting at 350lbs. Other major changes included: owning land rather than leasing, accounting for labor costs separate than including it in rent, and death loss was no longer designated as an operating cost, but rather a loss in revenue by carcasses sold at the end of the

Table 4. Changes from Davis Cost Study to AFEF Grass-Fed Beef Enterprise.

	U.C. Davis Beef Cost and Returns Study (Carcass Sales) - 2012	**AFEF Grass-Fed Beef Enterprise - 2013**
Area	Northern Sacramento Valley	Del Norte and Humboldt Counties
Number of Head	One group of 20 beef feeder heifers starting at 800 lbs. in the spring (April 15)	Two groups of 150 weaned dairy cross steers for a total of 300 head starting at 350 lbs. in the fall and spring
Duration	168 days	570-600 days
Land	Pasture is leased at $26/head/month labor included	Pasture is owned at $25/head/month
Grazing Season	Late spring through mid-fall	Year round except December and January
Beginning Value of Cattle	$1.30/lb.	$1.80/lb. (reflects a more accurate price of 2013's organic calf)
Harvest	October 1 at 1,100 lbs. finish weight	22-23 months of age at 1,300 lbs. finish weight
Assumed Average Daily Gain	1.78 lbs/day (300lbs over 168 days)	1.62 lbs/day (950lbs over 585 days)
Harvest Cost	Harvest $70, Cut and Wrap $0.90/lb.	Harvest $90, Cut and Wrap $1.25/lb.
Pasture Maintenance	None (paid by land owner)	Irrigation, Fertilization, Maintenance
Organic Certification	None	Approximately $2,000 per $250,000 gross sales
Salt	$5.75/head	$40/head (includes minerals, kelp)
Hay	$6/head	$50/month for winter ($100/head for spring start, $200/head for fall start)
Death Loss	Designated an operating cost (1% of purchase price)	Loss is in carcass not sold in gross income (2% for spring start and 2.5% for fall start because they live through two winters)
Vehicle Mileage	Mileage ($0.33/mi)	Mileage and maintenance cost ($1.77/mi)
Labor Cost	Included in land lease	$20/day for 600 days
Beef Enterprise Management	None	Included in ownership cost as office cost
Brand Inspection and Checkoff	$2/head	None (cattle does not change ownership)
Horse Cost	$10/head	None

season. Some item deletions include the removal of the brand inspection, beef check off, and horse cost. Additions included: pasture maintenance, organic certification, and management costs.

Changes to the format of the budget included adding a diagram to visually represent each calf cohort group life, and a field of inputs and assumptions to further modify the table in the future. Some of these inputs included differing death loss percentages based on the calf start group and yield percentages to further calculate income and costs of the final product. The differing death loss for each group better follows reality in that the fall start group enters winter at a younger age and must also live through two winters in total which would bring their death loss a little higher, 2.5 percent, than the spring start group, 2 percent. The yield percentages were found by looking through historical AFEF records for the years 2007 and 2010 (Appendix 3). Using this data, a scatter plot was made (Figure 4) to estimate a carcass yield of a 1,300 lb. steer at approximately 51% from AFEF. To this I added a modest 2% in yield due to the use of

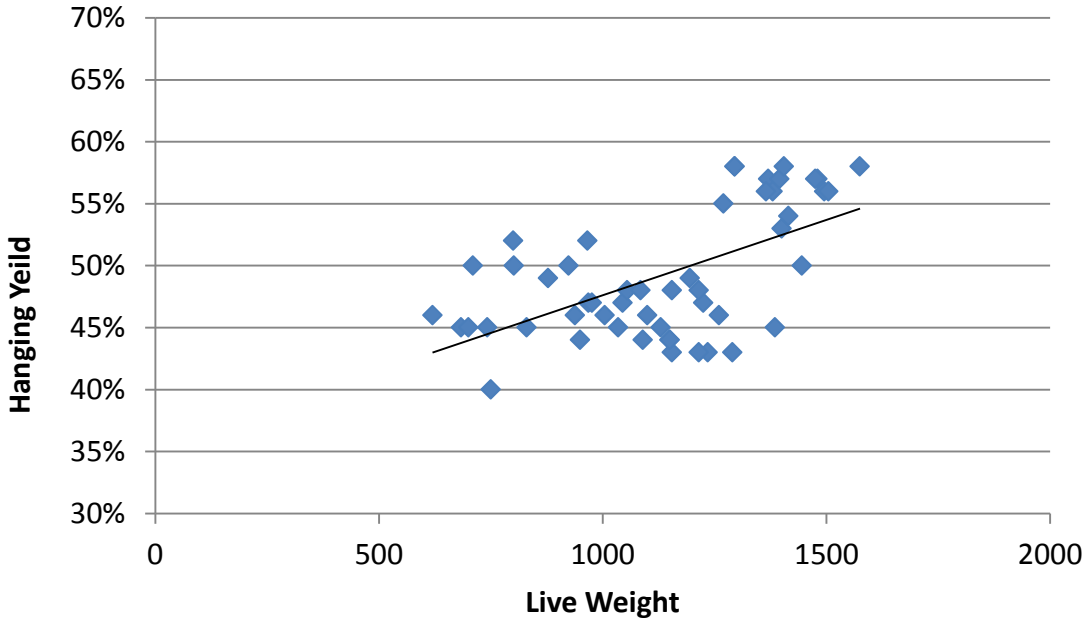

Figure 4. Scatterplot and Trend Line of 52 Grass-Fed Beef Weights and Dressing Percentages from AFEF, Years 2007, 2010.

Fleckvieh beef genetics going to be introduced to these diary steers.

Discussions with AFEF's proprietor brought a good estimate of all of the conditions necessary to make a workable cost-benefit analysis of a two season grass-fed beef operation. In Table 5 and Table 6 are the results of this two season enterprise analysis. Two major variables in these tables are the purchase price per pound and the selling price of packaged meat per pound. The first was found from talking to Blake Alexandre as he purchases and sells hundreds of organic dairy cattle year around. The second price, the price per pound of packaged product, would be the most important as it was the largest and only factor in the income of the enterprise.

Analyzing this price through breakeven analysis in Excel, Goal Seek was used to find the price that would set the net returns for the spring start group to a value of zero. As seen in Table 5, a preliminary breakeven price was found at $4.84/lb. of packaged meat sold. This price sets the gross value of the start-up group's net return to zero; however, the value per calf is still at a value of negative $13.00. This is because the breakeven on the pounds sold cannot account for product that was never sold due to death loss, but for which cost were still incurred.

In Table 6, for the Fall start group, this "breakeven price of $4.84" is not enough to reach net returns of zero due to the higher cost of feeding this group through two winters and the extra month that it will take to finish slower growing steers. For simplicity, this was recognized, but analysis was done only with regards to the breakeven of the spring start group.

Alexandre Family Ecodairy Farms

150 HEAD OF PURCHASED WEANED CALVES FINISHED ON GRASS – Spring Start

Del Norte County – 2013

Gross Income	**Number**	**Weight**	**Dollar Value**	**Gross Value**	**Value/Calf**
Packaged Meat Sold[1]	147	448	5	318,472	2,123
Spring Start Calves[2]	150	350	2	94,500	630
Total Gross Income				**223,972**	**1,493**
Cash Operating Costs		**Flat Cost**	**Cost/Calf**		
Pasture[3]			425	63,750	425
Salt / Mineral			40	6,000	40
Hay (winter months)[4]			100	15,000	100
Veterinary / Medical			10	1,500	10
Truck mileage/maint.		300		300	2
Stock trailer mileage/maint.		800		800	5
4 Wheeler mileage/maint.		100		100	1
Labor[5]		12,000		12,000	80
Harvest Cost			90	13,230	90
Cut and Wrap[6]			560	82,292	560
Marketing Costs		7,500		7,500	50
Field Maintenance			50	7,500	50
Organic Certification		4,000		4,000	27
Cost of Goods Sold				**213,972**	**1,439**
Income Above Cash Operating Costs				**10,000**	**54**
Ownership Costs (Overhead)					
Interest on Operating Costs (calves + operating cash)				4,000	27
Insurance (Vehicle, liability, etc.)				4,000	27
Overhead (utilities, office costs, legal and accounting)				1,000	7
Investments (Capital Recovery)				1,000	7
				10,000	**67**
Total Costs				**223,972**	**1,506**
Net Returns Above Total Costs				**0**	**(13)**

Spring Start Duration:

Year 1	Year 2
	January
February	February
March	March
April	April
May	May
June	June
July	July
August	August
September	September
October	October
November	November
December	

Assumptions:

Death Loss	2.0%
Yield	53%
Boned Yield	65%
Package Yield	34%
Finish Weight	1,300
Cut & Wrap	$1.25

Notes:

1. Assumes death loss calculated on the total purchased
2. Feb Born / Nov Harvest, 22 months, 1 Winter
3. 17 months at $25
4. 2 months at $50
5. $20/Day times 600 days
6. Packaged Meat times Cut and Wrap price

Table 5. 150 Head of Purchased Weaned Calves Grass-Fed for AFEF– Spring Start.

Alexandre Family Ecodairy Farms

150 HEAD OF PURCHASED WEANED CALVES FINISHED ON GRASS – Fall Start

Del Norte County – 2013

Gross Income	**Number**	**Weight**	**Dollar Value**	**Gross Value**	**Value/Calf**
Packaged Meat Sold[1]	146	448	5	316,306	2,109
Fall Start Calves[2]	150	350	2	94,500	630
Total Gross Income				**221,806**	**1,479**
Cash Operating Costs		**Flat Cost**	**Cost/Calf**		
Pasture[3]			400	60,000	400
Salt / Mineral			42	6,300	
Hay (winter months)[4]			200	30,000	200
Veterinary / Medical			11	1,650	11
Truck mileage/maint.		300		300	2
Stock trailer mileage/maint.		800		800	5
4 Wheeler mileage/maint.		100		100	1
Labor[5]		13,800		13,800	92
Harvest Cost			90	13,140	90
Cut and Wrap[6]			560	81,733	560
Marketing Costs		7,500		7,500	50
Field Maintenance			50	7,500	50
Organic Certification		4,000		4,000	27
Cost of Goods Sold				**226,823**	**1,487**
Income Above Cash Operating Costs				**(5,017)**	**(9)**
Ownership Costs (Overhead)					
Interest on Operating Costs (calves + operating cash)				4,000	27
Insurance (Vehicle, liability, etc.)				4,000	27
Overhead (utilities, office costs, legal and accounting)				1,000	7
Investments (Capital Recovery)				1,000	7
				10,000	**67**
Total Costs				**236,823**	**1,554**
Net Returns Above Total Costs				**(15,017)**	**(75)**

Fall Start Duration:

Year 1	Year 2	Year 3
	January	January
	February	February
	March	March
	April	April
	May	May
	June	June
	July	
August	August	
September	September	
October	October	
November	November	
December	December	

Assumptions:

Death Loss	2.5%
Yield	53%
Boned Yield	65%
Package Yield	34%
Finish Weight	1,300
Cut & Wrap	$1.25

Notes:

1. Assumes death loss calculated on the total purchased
2. Aug Born / May Harvest, 23 months, 2 Winter
3. 16 months at $25
4. 4 months at $50
5. $20/Day times 690 days
6. Packaged Meat times Cut and Wrap price

Table 6. 150 Head of Purchased Weaned Calves Grass-Fed for AFEF – Fall Start.

Partial Budgeting

Another analysis of AFEF's grass-fed beef enterprise was through an Iowa partial budget template of Hofstrand (2005). Seen in Table 7, this template was adopted to reflect AFEF's conditions as was done before from Forero, *et al.*, (2012) costs. In partial budgeting, emphasis was placed on increases and decreases in income and costs by looking at the entire operation and the effects of an enterprise change on that operation. By completing the decreases in net income portion of the partial budget, a forgotten factor was noticed. This factor was a decrease in net income provided by the loss of raising replacement dairy heifers with the same resources. Without the beef enterprise, more dairy replacement heifers would be raised instead of steers. This opportunity cost was not found in the UC Davis cost study, but was made apparent in the partial budget exercise with a value of $47,850 in lost income due to this new enterprise. This was calculated this by using the saved cost of approximately $319 attributed to raising replacement heifers in Humboldt and Del Norte Counties on farm instead of purchasing in the open market (Brodt 2011).

Using the partial budget, with opportunity cost, a new breakeven price of $5.57/lb. was calculated for packaged beef. This price more accurately reflects a differentiated grass-fed cut and wrapped breakeven price because opportunity costs are now included.

Table 7. Partial Budget Template Adapted to AFEF Grass-Fed Beef Enterprise.

Partial Budget

Ag Decision Maker -- Iowa State University Extension and Outreach

Name	Joseph Alexandre	Date	Friday, May 10, 2013
Description of Analysis	150 HEAD OF PURCHASED WEANED CALVES FINISHED ON GRASS – Spring Start		

Increases in Net Income		Decreases in Net Income	
Increase in Income		***Decrease in Income***	
Carcasses Sold (147 x 448lb x $5.567)**	$366,592	Selling Bull Calves (150 x 350lb x $1.80)	$94,500
	$0	Replacement Heifers (150 x $319)*	$47,850
Total Increase	**$366,592**	***Total Decrease***	**$142,350**
Decrease in Cost		***Increase in Cost***	
	$0	Pasture	$63,750
	$0	Salt / Mineral	$6,000
	$0	Hay (winter months)	$15,000
	$0	Veterinary / Medical	$1,500
	$0	Truck mileage/maint.	$300
	$0	Stock trailer mileage/maint.	$800
	$0	4 Wheeler mileage/maint.	$100
	$0	Labor	$12,000
	$0	Harvest Cost	$13,500
	$0	Cut and Wrap	$82,292
	$0	Marketing Costs	$7,500
	$0	Field Maintenance	$7,500
	$0	Organic Certification	$4,000
	$0	Interest on Operating Costs	$4,000
	$0	Insurance	$4,000
	$0	Overhead	$1,000
	$0	Investments	$1,000
Total Decrease	**$0**	***Total Increase***	**$224,242**
Increase in Net Income	**$366,592**	**Decrease in Net Income**	**$366,592**
Change in Net Income	**($0)**		

* Opportunity Cost not seen in Davis Adapted Budget

** New Breakeven Price with Opportunity Cost

Source: Hofstrand 2005.

Price Research

Because the primary product made through AFEF's grass-fed beef enterprise will be ground beef, product price research was found on internet grass-fed beef producer database sites including: California State University-Chico (2013), and FarmPlate of Woodstock (2013). On these sites, producer contact information and websites were found, which contained product pricing quotes for grass-fed ground beef, half, and whole sale of animals. Sixty-four websites containing price information (Appendix 4) for ground, half, or whole units of beef through online sales were found. This included 41 grass-fed beef operations that had quotes on ground beef (Figure 5) used as a price for the meat sold through the AFEF grass-fed enterprise.

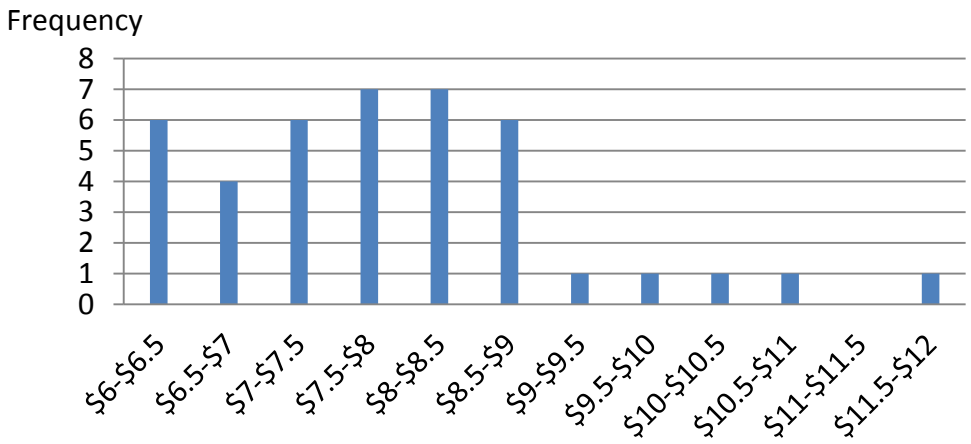

Figure 5. Distribution of Ground Beef Price Quotes for 41 CA Grass-Fed Firms, May, 2013.

With this information a mean and standard deviation was calculated (see Appendix 4). This would be used to calculate the approximate price at which the enterprise should sell its product. The mean ground beef price was $7.36 with a standard deviation of $1.19. Only one price quoted was below the discovered breakeven price of $5.57 for AFEF.

Price Analysis

As mentioned before, AFEF has had experience with value-added natural food enterprises. Alexandre Kids, LLC, has maintained a selling price over one standard deviation above the mean with organic pastured eggs. With this experience and brand recognition, placing a selling price for an organic grass-fed ground beef that is above the mean price is not a bad idea.

Figure 6 was made in order to better visualize the effects of choosing different prices for the final ground beef product. This graph has the income per calf for two different scenarios: the spring start budget formed by adopting the U.C. Davis cost study (red), and the same spring start group analyzed through partial budgeting where the replacement heifer opportunity cost are added (blue). The slope of these two lines is $438.89, meaning that for every increase in price of

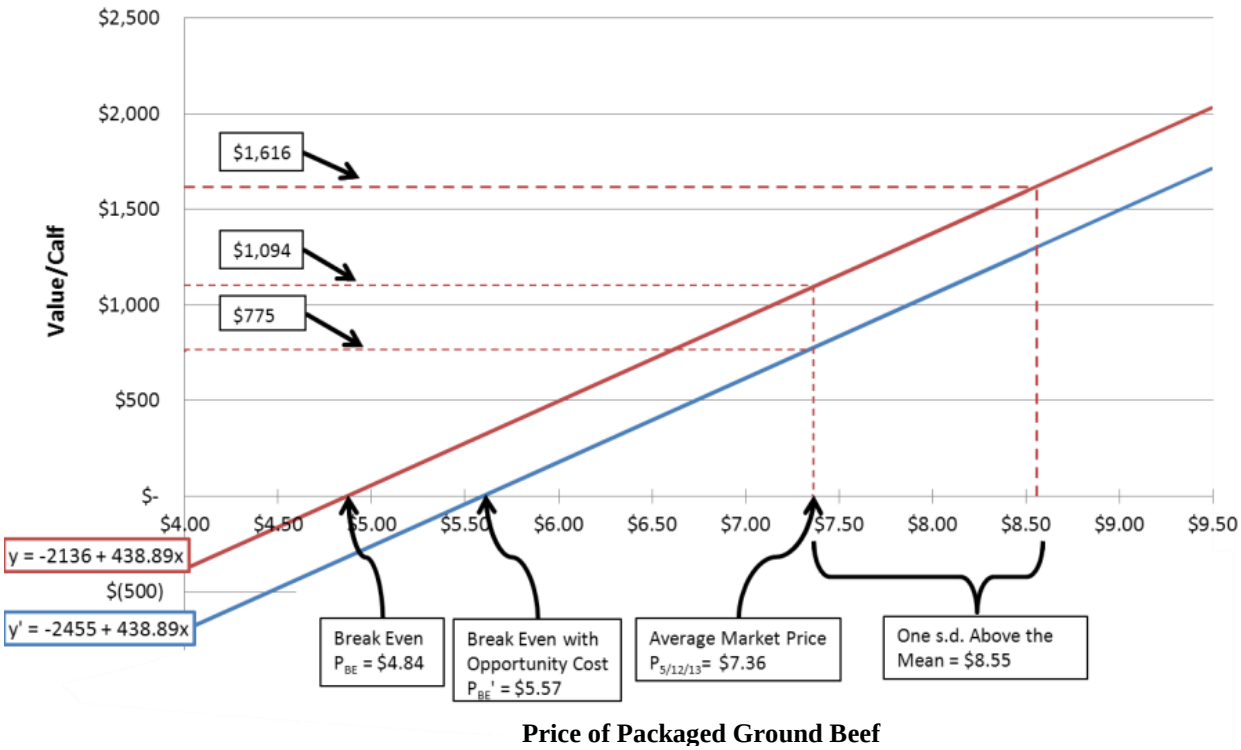

Figure 6. Value/Calf for Changing Ground Beef Price, with (red) and without Opportunity Cost (blue).

$1/lb., the income per steer increases approximately $439. At the mean price of $7.36/lb., net income is $775 and $1,094 profit per steer for the absence and included opportunity cost respectively.

The standard deviation found earlier was $1.19 for grass-fed ground beef. Given this, one standard deviation above the mean is $8.55. Between $7.36 and $8.55 is a safe place to set the ground beef price for the AFEF grass-fed beef enterprise. This brings a net income per steer of approximately $1,616 or $1,297 when opportunity costs are factored.

Product Label

Potential graphics for a grass-fed ground beef product label are shown in Figure 7. Other graphics could include: USDA organic seal, "Hormone Free" and "Natural" claims, and Humane Farm Animal Care "Certified Humane."

Figure 7. Plausible Graphics for AFEF Organic Grass-Fed Beef.

Chapter 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The creation of an organic grass-fed dairy beef enterprise for AFEF was assessed adopting and modifying a U.C. Davis beef cost and return study. AFEF would like to expand into another value added natural food enterprise and be able to retain diary bull calves that are currently sold at very low prices at one week of age. The main product of this enterprise was ground beef from two seasonal start groups of 150 weaned dairy steers. After variables were modified for climate, conditions, inputs, cost and revenues, a preliminary breakeven price for a grass-fed cut and wrapped product was found at $4.84. Further analysis was included through partial budgeting where the emergence of an unrealized opportunity cost presented itself. This being the loss in self-raised dairy replacement heifers that would be raised instead of grass-fed dairy steers due to pasture and resource constraints. With this opportunity cost now accounted for, the breakeven price for the ground beef was found at $5.57.

Price quotes were gathered from two online producer databases of California grass-fed beef producers. Sixty-four producers were quoted with 41 prices belonging to grass-fed ground beef. These quotes were analyzed and the mean price was $7.36 with a standard deviation of $1.19. At this price ground beef sold through the grass-fed beef enterprise brought $775 and $1,094 profit per steer in the absence and included opportunity cost respectively.

As demonstrated by one value added enterprise, Alexandre Kids, LLC, AFEF uses a price leadership strategy maintaining prices over one standard deviation above the mean. Following this strategy, AFEF would keep final product price for the grass-fed ground beef between $7.36 and one standard deviation above that, $8.55, will be a safe threshold at which to price the meat. At these prices, the net income per steer is approximately $1,616 or $1,297 when opportunity costs are factored.

Conclusions

AFEF should begin the grass-fed beef enterprise as described in this analysis. Through adapting and modifying a beef cost and returns study, ground beef can safely be priced between the mean, $7.36, and one standard deviation above the mean, $8.55, given past experiences by Alexandre Kids, LLC, in value added health food enterprises. At these prices, the realized profit per steer is $1,094 and $1,616 respectively. When opportunity cost of, $319/head, of raising less replacement heifers are added, income is $775 and $1,297. With this grass-fed beef enterprise, AFEF will be able to retain dairy bull calves and make a profit doing so.

Recommendations

The AFEF grass-fed beef enterprise should be started with no more than two groups of 150 head each in the spring and fall in order to simplify management and the cost of beginning such an enterprise. The enterprise budgets can be further analyzed to determine profitability with a few changing variables including: wean age, different beef breeds crossed with existing dairy genetics, and harvest age and weight.

In addition, AFEF dairy cull cows (defined as dairy cows whose milk production has diminished because of age), are being sold to Redwood Meat Co. With the addition of an AFEF grass-fed steer enterprise, a new value added market may be available for the meat from these grass-fed dairy cows, which are receiving lower market values at auction. The grass-fed cull cow meat could retain value when mixed in the form of ground beef with the grass-fed beef from the steer enterprise.

References Cited

Alexandre, Blake. 2013. Owner, Alexandre Family EcoDairy Farms. Personal Interview, Crescent City. January-June.

Brickley, Gerard. 2010. "US: Grass Fed Beef Demand Strengthening." *FeedInfo News Service*, Global Data Systems. Labège, France. May 3.

Brodt, Colton. 2001. "Organic Replacement Heifer Enterprise Budget for Walker Dairy." Unpublished Senior Project, California Polytechnic State University San Luis Obispo. Project #11-0015. March. pp. 1-35

Clarke, A.M., R.D. Evans, D.P. Berry, D.A. Kenny, M.J. Drennan, and M. McGee. 2009. "Intake, Live Animal Scores/measurements and Carcass Composition and Value of Late-maturing Beef and Dairy Breeds." *Livestock Science* (126:1-3). May, pp. 57-68.

California State University-Chico. 2013. "Grass-fed Beef Producer Contacts." College of Agriculture and University of California Cooperative Extension. Chico. <www.csuchico.edu/grassfedbeef/producer-contacts/grass-beef.shtml.>

Del Norte County Economic and Demographic Profile. 2012. Center for Economic Development at California State University, Chico. California Agricultural Statistics Service, California Department of Finance. December.

Dimitri, Carolyn, and Lydia Oberholtzer. 2009. "Marketing U.S. Organic Foods: Recent Trends from Farms to Consumers." Washington D.C.: U.S. Dept. of Agriculture, Economic Research Service, Economic Information Bulletin No. 58. September. pp. 1-23.

FarmPlate. 2013. "Meat and Farmers." Verdesca, LLC., Woodstock, VT, May. < http://www.farmplate.com/search/apachesolr_search?filters=tid%3A938 >

Forero, Larry C., Roger S. Ingram, Glenn A. Nader, Karen M. Klonsky, and Richard L. De Moura, 2012. "Sample Cost for Finishing Beef Cattle on Grass, 20 Head, Sacramento Valley." University of California, Cooperative Extension. Department of Agricultural and Resource Economics, Davis, Doc. No. BF-SV-12. pp. 1-12.

Garrett, W.N. 1971. "Energetic Efficiency of Beef and Dairy Steers." *Journal of Animal Science* (32:3). March. pp. 451-456.

George M., M.E. Robbins, F.L. Bell, W.J. vanRiet, G.G. Markegard, D. Lile, C.B. Wilson, Q.J. Barr. 1992. "By Budgeting Irrigated Pasture Growth Rates, Managers Control Forage Levels and Animal Performance." *California Agriculture* 46(3). May-June. pp. 27-30.

Gwin, Lauren, Catherine A. Durham, Jason D. Miller, and Ann Colonna. 2012. "Understanding Markets for Grass-Fed Beef: Taste, Price, and Purchase Preferences." *Journal of Food Distribution Research* (43: 2). July. pp. 91-111.

Hofstrand, Don. 2005. "Ag Decision Maker - Partial Budget," Cooperative Extension Service, Iowa State University of Science and Technology, Ames. Version 1.0. September.

Johnson, Rachel J., Daniel L. Marti, and Lauren Gwin. 2012. "Slaughter and Processing Options and Issues for Locally Sourced Meat." Washington D.C.: U.S. Dept. of Agriculture, Economic Research Service, Outlook No. LDPM-216-01. June. pp. 1-24.

Larson, Stephanie, Cary Thompson, Karen M. Klonsky, and Pete Livingston, 2004. "Sample Cost for a Cow-Calf/Grass-Fed Beef Operation, 200 Head Cowherd with 30 Grass-Fed Cattle in the North Coast Region, Marin and Sonoma Counties." University of California, Cooperative Extension. Department of Agricultural and Resource Economics. Davis, Doc. No. BF-NC-04. pp. 1-20.

Lozier, John, Edward Rayburn, Jane Shaw. 2004. "Growing and Selling Pasture-Finished Beef: Results of a Nationwide Survey." *Journal of Sustainable Agriculture* (25:2). October. pp. 93-112.

Rust, S. R., and C. S. Abney. 2005. "Comparison of Dairy versus Beef Steers." Managing and Marketing Quality Holstein Steers Conf. November 2-3. R. Tigner and J. Lehmkuhler eds., Wis. Agri-Serivice Assoc., Madison. pp. 161-174.

Thiboumery, A. and M. Lorentz. 2009. "Marketing Beef for Small-Scale Producers." Iowa State University Extension: Ames. Pp. 1-5.

Thilmany, Dawn, W. Umberger, and A. Ziehl. 2006. "Strategic Market Planning for Value-Added Natural Beef Products: A Cluster Analysis of Colorado Consumers." *Renewable Agriculture and Food Systems* (21:3). September. pp. 192–203.

Thilmany-McFadden, Dawn, Wendy Umberger, and Joshua Wilson. 2009. "Growing a Niche Market: A Targeted Marketing Plan for Colorado Homestead Ranches." *Review of Agricultural Economics* (31:4). Q4. pp. 984-998.

Tomek, William G. and Kenneth L. Robinson. 2003. *Agricultural Product Prices*, Fourth Edition. Cornell University Press. pp. 104-110.

U.S. Department of Agriculture, Agricultural Marketing Service. 2006. *Federal Register* (71:92). May. pp. 27662-27665.

U.S. Department of Agriculture, Agricultural Marketing Service. 2007. *Federal Register* (72:199). October. pp. 58631-58637.

Weber, Klaus, Kathryn L. Heinze, and Michaela DeSoucey. 2008. "Forage for Thought: Mobilizing Codes in the Movement for Grass-Fed Meat and Dairy Products." *Administrative Science Quarterly* (53:3). September. pp. 529-567.

Williams, A. R. 2006. "Natural/Organic Opportunities: Current Status and Future Projections." Jacob Alliance LLC, Rose Bud, AK. January. ppt. 1-22.

Ziehl, Amanda, Dawn D. Thilmany, and Wendy Umberger. 2005. "A Cluster Analysis of Natural Beef Product Consumers by Shopping Behavior, Importance of Production Attributes, and Demographics." *Journal of Food Distribution Research* (36:1). March. pp. 209-217.

APPENDIX

Appendix 1. Price Quotes from 8 Organic Egg Firms, May 24, 2013.

Red Hill Farms	Marin County, CA	$ 9.49
Alexandre Kids Eggs	Crescent City,CA	$ 8.99
Vital Farms	Austin, TX	$ 8.49
Clover Organic	Peteluma, CA	$ 5.69
Chino Valley Ranchers	Chino, CA	$ 5.49
Judy's Family Farm	Petaluma, CA	$ 4.99
Rock Island	Petaluma, CA	$ 3.59
365	Emeryville, CA	$ 3.29
	Mean	$ 6.25
	Standard Deviation	$ 2.43

Source: Whole Foods Market, San Rafael, CA, 2013.

Appendix 2. Univ. of Cal. Cooperative Extension Grass-fed Beef Enterprise Budget.

University of California Cooperative Extension

Table 1. 20 HEAD OF PURCHASED YEARLINGS FINISHED ON GRASS – Carcass Beef

Sacramento Valley – 2012

Gross Income	**Number**	**Weight**	**Dollar Value**	**Gross Value**	**[1]Per Calf**
Calves Purchased	20	800	130	20,800	1,040
Carcasses Sold[2]	20	627	2.75	34,485	1,724
Gross Income				**13,685**	**684**
Operating Costs					
Pasture (leased-based upon seasonal $156/cow or 1AU)[3]				3,120	156
Purchased Feed :	**Tons**	**Cost/unit**			
Salt	0.50	230.00		115	6
Hay	1.00	120.00		120	6
Veterinary/Medical				200	10
Death Loss (1% of purchased price)[2]			208	208	10
Truck Mileage	1000.00	0.555	555	555	28
Stock trailer mileage	400.00	0.20	80	80	4
4 Wheeler mileage	1000.00	0.22	220	220	11
Brand inspection			20	20	1
Checkoff (Marketing Order Promotion)			20	20	1
Harvest Cost	70.00		1,330	1,330	67
Cut and Wrap		0.90		10,722	536
Marketing Costs (brochures, fliers, newspaper advertisement)			1,500	1,500	75
Horse costs - shoes, vet, & feed			200	200	10
Total Cash Operating Costs				**18,410**	**921**
Income Above Cash Operating Costs				**-4,725**	**-237**
Ownership Costs					
Interest on Operating Costs (calves + operating cash) @ 5.75%			982	982	49
Insurance (Vehicle, liability, etc.)			1,500	1,500	75
Overhead (utilities, office costs, legal and accounting)			1,000	1,000	50
Investments (Capital Recovery)			100	100	5
Total Overhead (Cash & Non-Cash Overhead)				**3,582**	**179**
Total Costs				**21,992**	**1,100**
Net Returns Above Total Costs (Returns to Land and Management)				**-8,307**	**-415**

[1] Per Calf based on 20 head purchased

[2] Assumes a 1% death loss calculated on the total purchase price of the 20 head

Note: The cost of labor and health insurance is not included

[3] noted above but not defined here

Source: Forero, *et al.*, 2012.

Appendix 3. Historical Grass-Fed Beef Weights and Dressing Percentages from AFEF Years 2007, 2010.

Date	Live Wt.		Dressed		Boned	Date	Live Wt.		Dressed
1.12.07	1,370	57%	776	65%	504	1.28.10	710	50%	352
	1,495	56%	844	65%	549		742	45%	335
	1,395	57%	799	65%	519		802	50%	400
	1,270	55%	694	65%	451		878	49%	433
	1,480	57%	845	65%	549		924	50%	466
	1,575	58%	914	65%	594		620	46%	284
	1,380	56%	775	65%	504		1,130	45%	505
	1,365	56%	765	65%	497		1,225	47%	572
	1,475	57%	840	65%	546		1,045	47%	489
	1,400	53%	746	65%	485		966	52%	507
	1,295	58%	748	65%	486		1,055	48%	505
	1,405	58%	809	65%	526		1,215	48%	588
	1,295	58%	745	65%	484		1,100	46%	508
	1,505	56%	844	65%	549		1,235	43%	535
	1,415	54%	770	65%	501		1,260	46%	579
Mean	1,408	56%	794				1,385	45%	617
							1,155	43%	498
							1,215	43%	527
							1,445	50%	725
							1,150	44%	505
							1,290	43%	556
							1,035	45%	464
							1,155	48%	558
							1,085	48%	522
							1,150	44%	508
							968	47%	455
							976	47%	456
							830	45%	376
							938	46%	434
							1,195	49%	588
							1,005	46%	461
							684	45%	310
							1,090	44%	483
							800	52%	416
							700	45%	312
							950	44%	419
							750	40%	299
					Mean		1,023	46%	474

Source: AFEF Ranch Records, 2013.

Appendix 4. Price Quotes from 64 Grass-Fed Beef Firms, May 12, 2013.

Claim in addition to Grass-Fed	Ranch	Ground Beef	Half Beef	Whole Beef	Website	California City/Area
	4505 Meats	$9.99			http://4505meats.com	San Francisco
	Alhambra Valley Beef	$5.99	$7.15	$6.70	http://www.silverspringsbeef.com	Martinez
	Alston Farms	$8.50			http://www.alstonfarms.com	Orland
	Bear River Valley Beef	$5.50	$7.25		http://bestgrassfedbeef.com	Humbuldt
	Big Bluff Ranch*		$7.50		http://www.bigbluffranch.com	Red Bluff
	Brandon Natural Beef	$6.50			http://brandonnaturalbeef.com	San Francisco
	Chaffin Family Orchards		$7.35		http://www.chaffinfamilyorchards.com	Oroville
	Charter Oak Style Meats	$6.00			http://charteroak.slo-ag.com	Templeton
	Connolly Ranch Inc.		$8.80		http://www.connollyranch.com	Tracy
	Delta Farm. LLC			$6.50	http://www.delta-farm.com	Loomis
	DeyDey's Best Beef Ever	$8.00	$9.67		http://www.bestbeefever.com	Lompoc
Grass-Finished	Divide Ranch	$5.99	$6.50		http://thedivideranch.com	Elk Creek
	Douglas Ranch Meats		$7.99	$7.50	http://douglasranchmeats.com	Paicines
	Douglass Ranch*		$6.76		http://www.douglassranch.com	Orland
	Fair Oaks Ranch	$7.00			http://forangus.com	Paso Robles
	Ferndale Farms*		$5.97	$5.62	http://www.ferndalefarms.com	Ferndale
	Flying Mule Farm	$6.99			http://flyingmulefarm.com	Auburn
	Fouch Farms			$6.95	http://www.fouchfarms.com	Mariposa County
	Freestone Ranch		$6.60		http://www.freestoneranch.com	Valley Ford
	Frosty Acres		$7.00		http://www.frostyacres.net	Adin
	Grossi Natural Beef*		$5.10		http://grossinaturalbeef.com	Novato
	Hat Creek Grown	$6.49			http://hatcreekgrown.com	Hat Creek
	Hearst Ranch	$8.00			http://www.hearstranch.com	San Francisco
	High Sierra Beef	$8.25	$8.00	$8.00	http://www.highsierrabeef.com	Oregon House
	Holding Ranch	$6.99	$6.29	$5.79	http://www.holdingranch.com	Montague
	Johansing Farms*		$8.00		http://johansingfarmsales.com	San Miguel
Grass-Finished	Leftcoast Grassfed*	$6.00			http://www.leftcoastgrassfed.com	Pescadero
	Lucky Dog Ranch	$7.00			http://www.luckydogranchbeef.com	Dixon
	Marin Sun Farms	$7.99			http://marinsunfarms.csaware.com	San Francisco
	Markegard Family	$7.25	$6.49		http://markegardfamily.com	Half Moon Bay
	Massa Natural Meats*	$6.99	$9.37		www.MassaNaturalMeats.com	Glenn County
	Miller Ranch Enterprises *		$3.34	$3.32	http://www.millerranchenterprises.com	Oakdale
	Missing Jack Ranch	$7.00	$9.15		http://missingjackranch.com	Nipomo
	Morris Grassfed		$6.75		http://www.morrisgrassfed.com	San Juan Bautista
Grass-Finished	Nevada County Free Range Beef		$7.25	$7.25	http://nevadacountyfreerangebeef.com	Nevada City
Organic	Nick Ranch	$10.00			http://www.enjoygrassfedbeef.com	Santa Margarita
	Open Space Meats	$6.89			http://www.openspacemeats.com	Newman
Organic	Organic Prairie	$11.00			http://www.organicprairie.com	CA
	Page River Bottom Farm		$8.00	$8.00	http://www.pageriverbottomfarm.com	Reedley
	Paicines Ranch	$7.75			http://paicinesranch.com	Paicines
	Pastoral Plate	$7.75			http://pastoralplate.com	Sonoma County
Organic	PL Bar Ranch	$5.89			http://chowhound.chow.com/topics/402176	Gonzales
	Potter 8 Ranch*		$6.20		http://potter8ranch.com	Loyalton
	Prather Ranch Meat Co.		$5.89	$5.69	http://prmeatco.com	San Francisco
	Round Valley Raised	$7.00			http://www.goodeggs.com	Cocelo
Green-Fed	Sage Mountain Beef*	$9.00			http://sagemountainbeef.squarespace.com	Aquanga
	Salmon Creek Ranch	$7.99			http://www.salmoncreekranch.com	Bodega
Organic	Scott River Ranch	$7.15			http://www.scottriverranch.com	Etna
	Shady Oak Ranch		$7.75		http://www.shadyoakranch.net	Valley Springs
	Shafer Family Farm			$5.35	http://www.shaferfamilyfarm.com	Parlier
	Sierra View Farms			$3.75	http://www.foothillgrassfed.com	Snelling
	Sinclair Family Farm	$6.99	$7.00		http://www.sinclairfamilyfarm.net	Penryn
	Springville Beef	$7.50	$7.50	$7.25	http://springvillebeef.com	Springville
	Stemple Creek Ranch*	$8.00		$5.00	http://stemplecreek.com	Tomales
	Storm Valley Ranch	$7.50	$5.95	$5.95	http://stormvalleyranch.com	Placerville
	Striking A Livestock*		$6.53		http://strikingalivestock.com	Vina
	Swanton Pacific Ranch	$7.50			http://www.spranch.org	San Luis Obispo
	Tawanda Farms*	$5.75	$7.15	$7.33	http://www.meats.tawandafarms.com	Montague
	Templeton Hills Beef	$8.00			http://templetonhillsbeef.com	Templeton
	Thompson Valley Ranch	$6.49	$7.29		http://www.tvrgrassfed.com	Quincy
Organic	True Grass Farms*		$14.29	$14.29	http://truegrassfarms.com	Valley Ford
	Twisted Horn Ranch	$8.00			http://www.twistedhornranch.net	Bloomfield
	Victorian Farmstead	$7.25			http://www.vicfarmmeats.com	Sebastopol
	Winterprot Farm	$5.75	$7.00		http://www.winterportfarm.com	Sacramento
	Mean	$7.36	$7.32	$6.68		
	Standard Deviation	$1.19	$1.73	$2.31		

* Values were formulated using avilable information

Sources: California State University-Chico; FarmPlate.